

Computer Science II

Computing Systems

Devices

- 1 Illustrate ways computing systems implement logic through hardware components. [11-12.CS.D.01](#)

Hardware & Software

- 2 Describe and categorize roles of an operating system. [11-12.CS.HS.01](#)

Troubleshooting

- 3 Develop, communicate and apply systematic troubleshooting strategies for correction of errors in computing systems. [9-10.CS.T.01](#)
- 4 Describe how hardware components facilitate logic, input, output and storage in computing systems. [11-12.CS.T.01](#)

Networks & the Internet

Network Communication & Organization

- 1 Analyze the relationship between routers, switches, servers, topology and addressing. [11-12.NI.NCO.01](#)
- 2 Describe key protocols and underlying processes of internet-based services (e.g., http/https and Simple Mail Transfer Protocol (SMTP)/internet Message Access Protocol (IMAP), routing protocols). [11-12.NI.NCO.02](#)
- 3 Explain how the characteristics of the internet influence the systems developed on it. [11-12.NI.NCO.03](#)

Cybersecurity

- 4 Compare and refine ways in which software developers protect devices and information from unauthorized access. [11-12.NI.C.01](#)
- 5 Analyze cryptographic techniques to model the secure transmission of information. [11-12.NI.C.02](#)

Data & Analysis

Storage

- 1 Compare different bit representations of data types, such as characters, Booleans and numbers while recognizing when using each data type is appropriate. [11-12.DA.S.01](#)

Collection, Visualization & Transformation

- 2 Create data visualizations to help others better understand real-world phenomena. [9-10.DA.CVT.01](#)
 - 3 Generate data sets that use a variety of data collection tools and analysis techniques to support a claim and/or communicate information. [11-12.DA.CVT.01](#)
-

Inference & Models

- 4 Evaluate the ability of models and simulations to test and support the refinement of hypotheses. [11-12.DA.IM.01](#)
-

Algorithms & Programming

Algorithms

- 1 Critically examine and trace classic algorithms (e.g., selection sort, insertion sort, binary search, linear search). [11-12.AP.A.01](#)
 - 2 Implement an artificial intelligence algorithm to interact with a human or solve a problem. [11-12.AP.A.02](#)
 - 3 Describe how artificial intelligence algorithms drive many software and physical systems (e.g., autonomous robots, computer vision, pattern recognition, text analysis). [11-12.AP.A.03](#)
 - 4 Evaluate algorithms (e.g., sorting, searching) in terms of their efficiency and clarity. [11-12.AP.A.04](#)
-

Variables

- 5 Create problem solutions that utilize data structures (e.g., lists, arrays, ArrayLists). [11-12.AP.V.01](#)
-

Control

- 6 Trace the execution of iteration (e.g., loops, recursion), illustrating output and changes in values of named variables. [11-12.AP.C.01](#)
-

Modularity

- 7 Construct solutions to problems using student-created components (e.g., procedures, modules, objects). [11-12.AP.M.01](#)
 - 8 Create programming solutions by reusing existing code (e.g., libraries, Application Programming Interface (APIs), code repositories). [11-12.AP.M.02](#)
 - 9 Analyze a large-scale computational problem and identify generalizable patterns that can be applied to a solution. [11-12.AP.M.03](#)
-

Program Development

- 10 Use integrated development environments (IDEs) and collaborative tools and practices (code documentation) in a software project. [11-12.AP.PD.01](#)
- 11 Plan and develop programs using a development process (e.g., waterfall, iterative, spiral, rapid application development, agile). [11-12.AP.PD.02](#)
- 12 Identify and compare features of various programming languages that make them useful for solving problems and developing systems. [11-12.AP.PD.](#)

- 13 Design software using version control. 11-12.AP.PD.04
- 14 Develop and use a series of test cases to verify that a program performs according to its design specifications. 11-12.AP.PD.05
- 15 Explain security issues that might lead to compromised computer programs. 11-12.AP.PD.06
- 16 Evaluate key qualities of a program through a process such as a code review. 11-12.AP.PD.07

Impacts of Computing

Culture

- 1 Evaluate the impact of equity, access and influence on the distribution of computing resources in a global society. 11-12.IC.C.01

Safety, Laws & Ethics

- 2 Explain the beneficial and harmful effects that intellectual property laws can have on innovation. 9-10.IC.SLE.01
- 3 Explain the privacy concerns related to the collection and analysis of information about individuals that may not be evident to users. 9-10.IC.SLE.02
- 4 Identify and explain the potential impacts and implications of emerging technologies on larger social economic and political structures with evidence from credible sources. 9-10.IC.SLE.05
- 5 Debate laws and regulations that impact the development and use of software. 11-12.IC.SLE.01

Prepare for Employment

6 Prepare for Employment

Demonstrate working as a team.

- 1 Demonstrate working as a team.

Identify careers in the computer science field

- 2 Identify careers in the computer science field

Demonstrate communication skills.

- 3 Demonstrate communication skills.

Discuss ethical behaviors in the workplace.

- 4 Discuss ethical behaviors in the workplace.

Demonstrate interpersonal skills.

- 5 Demonstrate interpersonal skills.

Exhibit leadership skills through a student

- 6 Exhibit leadership skills through a student organization (e.g. FBLA, PBL, ACM)

organization (e.g. FBLA,
PBL, ACM)

**Develop documentation
for a job search in
computer science.**

7 Develop documentation for a job search in computer science.